

BACKGROUND

- Staged bilateral total hip arthroplasty (BTHA) is a common strategy for managing bilateral hip osteoarthritis^[1,2].
- Optimal timing between procedures remains inconsistent in literature^[3,4].
- Literature is sparse for THA, most studies lack multivariable regression and PROMs
- This study aimed to **assess whether inter-stage timing influenced 90-day complication rates or failure to achieve a minimal clinically important difference (MCID) on patient-reported outcomes (PROs).**

METHODS

- Retrospective study at a single large-volume institute.
- Patients aged 18-89 who underwent staged BTHA from 2014-2024.

- Grouping based on timing between stages:
- Binned into quartiles
 - Binary variable (≤6 vs >6 weeks)
 - Continuous time variable (scaled per 30 days)

- Primary outcomes:
- 90-day complication after second THA
 - Failure to meet MCID at one-year after second stage
 - Hip Disability and Osteoarthritis Outcome Score Joint Replacement (**MCID = 23**)
 - Veterans RAND 12-item Physical and Mental Component Scores (**MCID = 5**)

RESULTS

- Total of 1,400 patients
- 4.8% overall pooled complication rate

- Inter-stage timing not independently associated with:
- 90-day complications
 - Failure to meet MCID on any PROs

- Failure to meet MCID after index procedure was a significant predictor of subsequent failure.
- HOOS JR (OR = 15.67; *P* < 0.001)
 - VRS-12 PCS (OR = 23.57; *P* < 0.001)
 - VRS-12 MCS (OR = 10.29; *P* < 0.001)

Table 1. Demographic and Surgical Variables Prior to Second Stage: Quartiles

Preoperative Variables	Total (N=1,400)	≤112 days (n=355)	>112 to ≤322 days (n=349)	>322 to ≤841 days (n=347)	>841 days (n=349)	P-value
Age, years	63.5 ± 9.8	61.5 ± 10.3	65.0 ± 9.7	63.4 ± 9.7	64.0 ± 9.3	< 0.001
Sex						
Women	810 (57.9)	195 (54.9)	206 (59.0)	202 (58.2)	207 (59.3)	0.623
Men	590 (42.1)	160 (45.1)	143 (41.0)	145 (41.8)	142 (40.7)	
BMI, kg/m^2	29.4 ± 6.0	29.6 ± 6.2	29.3 ± 5.9	29.4 ± 5.9	29.3 ± 6.1	0.942
CCI						
≤1	304 (21.7)	95 (26.8)	57 (16.3)	78 (22.5)	74 (21.2)	0.156
2	458 (32.7)	124 (34.9)	119 (34.1)	110 (31.7)	105 (30.1)	
3	373 (26.6)	81 (22.8)	100 (28.7)	93 (26.8)	99 (28.4)	
4	182 (13.0)	38 (10.7)	51 (14.6)	45 (13.0)	48 (13.8)	
≥5	83 (5.9)	17 (4.8)	22 (6.3)	21 (6.1)	23 (6.6)	
ASA Class						
I-II	1098 (78.4)	272 (76.6)	271 (77.7)	274 (79.0)	281 (80.5)	0.622
III-IV	302 (21.6)	83 (23.4)	78 (22.3)	73 (21.0)	68 (19.5)	
Smoking Status						
Never	700 (50.0)	175 (49.3)	173 (49.6)	175 (50.4)	177 (50.7)	0.945
Former	616 (44.0)	157 (44.2)	156 (44.7)	155 (44.7)	148 (42.4)	
Active	84 (6.0)	23 (6.5)	20 (5.7)	17 (4.9)	24 (6.9)	
Any Complication: Stage 1	51 (3.6)	8 (2.3)	12 (3.4)	13 (3.7)	18 (5.2)	0.232
HOOS JR.	n=376	n=97	n=101	n=97	n=81	
Preoperative: Stage 2	51.6 ± 14.5	49.1 ± 17.0	51.6 ± 14.6	53.7 ± 11.7	52.1 ± 13.9	0.194
Failed to Meet MCID: Stage 1	67 (17.8)	16 (16.5)	17 (16.8)	21 (23.7)	11 (13.6)	0.336
VRS-12 PCS	n=492	n=121	n=124	n=129	n=118	
Preoperative: Stage 2	29.8 ± 8.8	28.7 ± 9.1	30.2 ± 8.6	29.9 ± 8.9	30.4 ± 8.4	0.326
Failed to Meet MCID: Stage 1	48 (9.8)	10 (8.3)	12 (9.7)	19 (14.7)	7 (5.9)	0.117
VRS-12 MCS	n=489	n=120	n=1222	n=129	n=118	
Preoperative: Stage 2	52.6 ± 10.9	52.6 ± 11.2	51.3 ± 10.5	53.1 ± 10.2	53.4 ±11.6	0.194
Failed to Meet MCID: Stage 1	212 (43.4)	50 (41.7)	64 (52.5)	49 (38.0)	49 (41.5)	0.115

Table 2. Demographic and Surgical Variables Prior to Second Stage: Binary (≤6 weeks vs >6 weeks)

Preoperative Variables	Total (N=1400)	≤6 weeks (n=100)	>6 weeks (n=1300)	P-value
Age, years	63.5 ± 9.8	59.7 ± 9.6	63.7 ± 9.8	< 0.001
Sex				
Women	810 (57.9)	49 (49.0)	761 (58.5)	0.063
Men	590 (42.1)	51 (51.0)	539 (41.5)	
BMI, kg/m^2	29.4 ± 6.0	28.7 ± 5.4	29.4 ± 6.0	0.291
CCI				
≤1	304 (21.7)	34 (34.0)	270 (20.8)	0.011
2	458 (32.7)	35 (35.0)	423 (32.5)	
3	373 (26.6)	20 (20.0)	353 (27.2)	
4	182 (13.0)	7 (7.0)	175 (13.5)	
≥5	83 (5.9)	4 (4.0)	79 (6.1)	
ASA Class				
I-II	1098 (78.4)	88 (88.0)	1010 (77.7)	0.016
III-IV	302 (21.6)	12 (12.0)	290 (22.3)	
Smoking Status				
Never	700 (50.0)	51 (51.0)	649 (49.9)	0.861
Former	616 (44.0)	42 (42.0)	574 (44.2)	
Active	84 (6.0)	7 (7.0)	77 (5.9)	
Any Complication: Stage 1	51 (3.6)	3 (3.0)	48 (3.7)	0.722
HOOS JR.	n=376	n=22	n=354	
Preoperative: Stage 2	51.6 ± 14.5	47.2 ± 19.6	51.9 ± 14.1	0.157
Failed to Meet MCID: Stage 1	67 (17.8)	3 (13.6)	64 (18.1)	0.778
VRS-12 PCS	n=492	n=35	n=457	
Preoperative: Stage 2	29.8 ± 8.8	27.8 ± 10.6	29.9 ± 8.6	0.092
Failed to Meet MCID: Stage 1	48 (9.8)	4 (11.4)	44 (9.6)	0.765
VRS-12 MCS	n=489	n=35	n=454	
Preoperative: Stage 2	52.6 ± 10.9	49.4 ± 12.8	52.8 ± 10.7	0.177
Failed to Meet MCID: Stage 1	212 (43.4)	19 (54.3)	193 (42.5)	0.176

Table 3. Failure to Meet MCID for PROMs After Second-Stage: Quartiles

Stage 2 Patient Reported Outcome Measures: Quartiles	Sample Sizes	Failure to reach MCID (n)	Failure to Reach MCID (%)	P-value
HOOS JR	N = 376	97	25.8	
Q1 (≤112 days)	97	25	25.8	
Q2 (>112 to ≤322)	101	27	26.7	0.354
Q3 (>322 to ≤841)	97	29	29.9	
Q4 (>841 day)	81	16	19.8	
VR-12 PCS	N = 492	66	13.4	
Q1 (≤112 days)	121	11	9.1	
Q2 (>112 to ≤322)	124	17	13.7	0.108
Q3 (>322 to ≤841)	129	22	17.1	
Q4 (>841 day)	118	16	13.6	
VR-12 MCS	N = 489	191	39.0	
Q1 (≤112 days)	120	46	38.3	
Q2 (>112 to ≤322)	122	58	47.5	0.742
Q3 (>322 to ≤841)	129	44	34.1	
Q4 (>841 day)	118	43	36.4	

CONCLUSION

- Timing between staged BTHAs does not influence 90-day complication risk or failure to achieve MCID at one-year.
- Failure to achieve MCID after the first surgery was a strong predictor of subsequent failure.
- Staging interval should be individualized based on patient preference, logistical considerations, and clinical optimization.

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